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NORTH ATLANTIC RIGHT WHALE SIGHTING SURVEY (NARWSS)

The North Atlantic Right Whale Sighting Survey (NARWSS) is a NOAA Fisheries program which locates and records the seasonal distribution of North Atlantic right whales (*Eubalaena glacialis*) off the northeastern coast of the United States. NARWSS flights conducted in 2011 followed systematic track lines with randomized starting locations within 11 primary survey blocks: Cashes Ledge, Georges Basin, Georges Shoal, Great South Channel, Howell Swell, Jeffreys Ledge, Jordan Basin, Lindenkohl Basin, Rhode Island Sound, Stellwagen Bank, and Stellwagen Sanctuary. During 2011, NARWSS flew 247 hours over 55 surveys, including a sawtooth survey over the Stellwagen Bank National Marine Sanctuary, a directed flight to locate a humpback whale carcass, and a directed flight to assist the *R/V Delaware II* North Atlantic Right Whale Biology Cruise. NARWSS detected 473 right whales within survey blocks and sighted an additional 28 right whales during transits to or from survey areas. Table 1 summarizes survey effort and right whale sightings by month. Figures 1a-c display the locations of right whales and survey effort by season. NARWSS did not conduct aerial surveys from July through October of 2011. Table 2 provides a comparison of NARWSS flights, flight hours, and right whale sightings across years.

RIGHT WHALE SIGHTING ADVISORY SYSTEM (RWSAS)

In 2009, the Right Whale Sighting Advisory System (RWSAS) was re-engineered to support new regulations to reduce the threat of ship collisions with right whales (50 CFR Part 224). The regulations establish speed restrictions of 10 knots or less for all vessels of length 65 ft (19.8 m) or greater within Seasonal Management Areas (SMAs). The SMAs encompass high-risk vessel collision areas along the U.S. Atlantic seaboard where right whale sightings predictably and consistently occur each year¹. When three or more right whales are sighted in close proximity but outside of SMAs, a Dynamic Management Area (DMA) is established for 15 days to accommodate the whales' movements (Clapham and Pace 2012²) and mariners are expected to either avoid the area or travel through it at 10 knots or less. The size of the DMA depends on the number of right whales sighted in the area. Mariners are notified of DMAs via email, an interactive Google Map website³, Broadcast Notice to Mariners (BNM), NOAA Weather Radio, and the Mandatory Ship Reporting system (MSR). Unlike SMAs, compliance is voluntary for DMAs. In 2011, 24 DMAs (including extensions) were triggered by validated reports, of which 10 came from NARWSS. The RWSAS continued collecting sighting reports from sources including aerial surveys, shipboard research surveys, commercial whale watch vessels, and opportunistic sources (Coast Guard, commercial ships, fishing vessels, and the general public). The most common source of reports in 2011 was aerial surveys (393 reports - 50%; see Table 3). Most sightings were in the Northeast (New York through Maine), where the number of reports per month ranged from 7 in July to 187 in April (Figure 2a and Table 3a). Most reports in the Mid-Atlantic (New Jersey through Virginia) were from the Coast Guard (Figure 2b and Table 3b). Most reports in Canadian waters were from shipboard research surveys (Figure 2a and Table 3c). Logging acoustic detections was discontinued in 2009 due to their frequency. Instead, public and shipping interests were provided links to the automated acoustic detection websites maintained by the Bioacoustics Research Program at the Cornell Lab of Ornithology⁴.

¹ <http://www.nmfs.noaa.gov/pr/shipstrike/>

² <http://www.nefsc.noaa.gov/publications/crd/crd0106/>

³ <http://www.nefsc.noaa.gov/psb/surveys/>

⁴ <http://www.listenforwhales.org/>

Table 1. Summary of North Atlantic Right Whale Sighting Survey (NARWSS) flights conducted in 2011 by month including the survey block, number of flights, flight hours, and right whale sightings. All flights followed systematic track lines with randomized starting locations within survey blocks. Shaded cells indicate month and survey area in which a Dynamic Management Area (DMA) was in effect, triggered by a confirmed report of 3 or more right whales in close proximity outside of a Seasonal Management Area (SMA). These DMAs were triggered by reports from the NARWSS as well as other sources.

Month	Total Number of Flights in Each Survey Block											Number of Flights	Flight Hours ¹	Number of Right Whales ²
	Cashes Ledge	Georges Basin	Georges Shoal	Great South Channel	Howell Swell	Jeffreys Ledge	Jordan Basin	Lindenkuhl Basin	Rhode Island Sound	Stellwagen Bank	Stellwagen Sanctuary			
January	1			2		1	2		1	2		9	35.6	15
February						1	1					2	9.0	1
March	2		1	1		1	1		1	1		8	35.9	30
April				3	1				2	1		7	35.0	158
May				2					1	1		4	16.4	45
June	1	1		3	1	1		1	1		1	11	52.9	78
July												0	0.0	0
August												0	0.0	0
September												0	0.0	0
October												0	0.0	0
November	2			1		1	2		1			7	33.0	115
December	2			1		2	1			1		7	29.0	31
Number of Flights	8	1	1	13	2	7	7	1	7	6	1	55	246.8	473
Flight Hours ¹	40.2	5.3	3.2	52.7	10.2	29.1	35.3	5.5	25.6	36.5	3.2	246.8		
Number of Right Whales ²	85	0	0	102	9	33	53	20	70	101	0	473		
¹ Flight Hours - includes time on transit, survey, and circling to photograph whales														
² Number of Right Whales - includes duplicate individuals; does not include whales seen on transit														
Additional DMAs: off Sandy Hook, NJ in January; Nantucket Sound in April; south of Martha’s Vineyard, MA in April; and Cape Cod Bay in December														

Table 2. Comparison of North Atlantic Right Whale Sighting Survey (NARWSS) flights conducted from 2002-2011 including the number of flights, flight hours, and the number of right whale sightings.

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Number of Flights ¹	103	101	82	129	86	62	53	66	59	55
Flight Hours ²	527	485	397	617	449	374	295	330	280	247
Number of Right Whales ³	798	453	294	831	411	841	639	584	476	473

¹Number of Flights – includes various types of flights depending on year (randomized systematic, directed and exploratory)
²Flight Hours - includes time on transit, survey, and circling to photograph whales
³ Number of Right Whales - includes duplicate individuals; does not include whales seen on transit

Table 3. The total number of right whale sighting reports to the Right Whale Sighting Advisory System (RWSAS) in 2011 by reporting source and month within the (A) Northeast region- Maine through New York, (B) Mid-Atlantic region- New Jersey through Virginia, and (C) Canadian waters.

(A) Northeast

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total Reports	%
Aerial Survey	49	26	101	82	65	26					30	11	390	54%
Shipboard Survey	20	18	11	28	9				14	5	4	1	110	15%
Whale Watch			3	33	15	1	3	10	13	13	14		105	14%
Coast Guard			1	5							1	1	8	1%
Commercial / Fishing			2	1			1		1		1		6	1%
Opportunistic	3	8	12	38	17		3	6	3	2	14	3	109	15%
Total Reports	72	52	130	187	106	27	7	16	31	20	64	16	728	100%

(B) Mid-Atlantic

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total Reports	%
Aerial Survey														0%
Shipboard Survey														0%
Whale Watch														0%
Coast Guard	2	3	4			1						2	12	74%
Commercial / Fishing		1				1							2	13%
Opportunistic			1									1	2	13%
Total Reports	2	4	5			2						3	16	100%

(C) Canada

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total Reports	%
Aerial Survey											3		3	8%
Shipboard Survey								14	22				36	90%
Whale Watch							1						1	2%
Coast Guard														0%
Commercial / Fishing														0%
Opportunistic														0%
Total Reports							1	14	22		3		40	100%

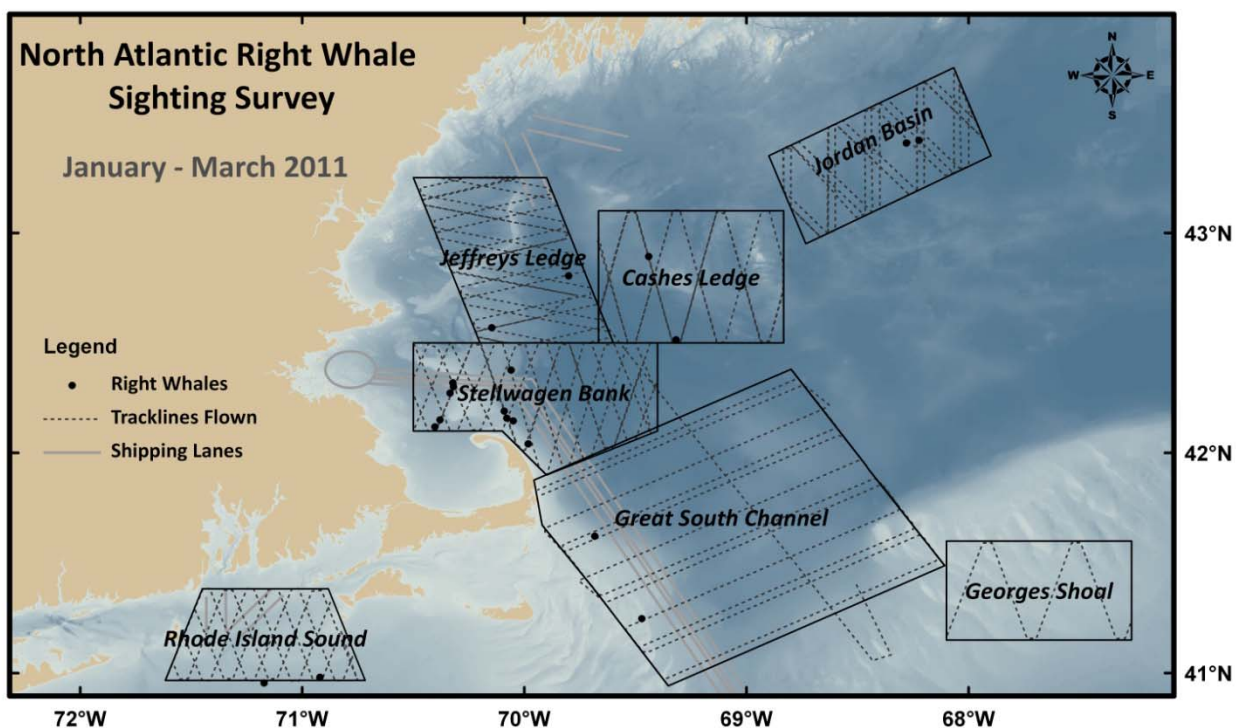


Figure 1a. North Atlantic Right Whale Sighting Survey (NARWSS) tracklines and right whale sightings from January through March, 2011. Northwest – southeast lines through the Great South Channel were a directed flight to relocate a dead humpback whale.

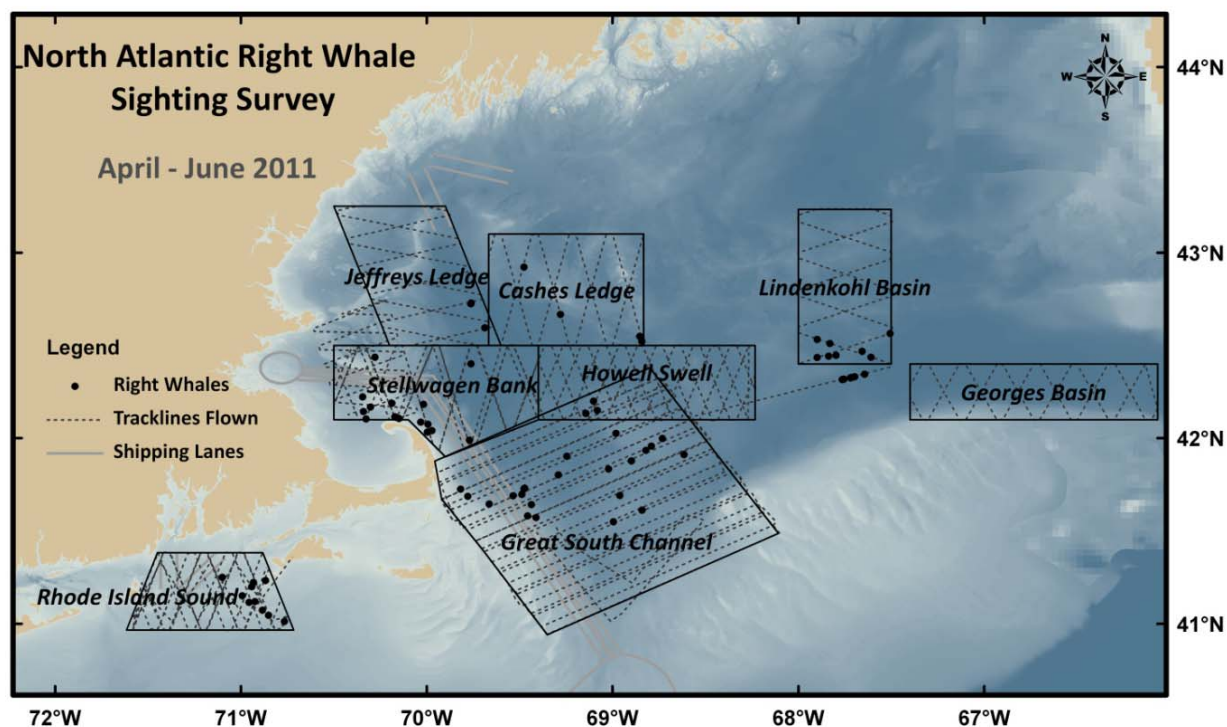


Figure 1b. North Atlantic Right Whale Sighting Survey (NARWSS) track lines and right whale sightings from April through June, 2011. Irregular lines in the Great South Channel were a directed flight to assist *R/V Delaware II* North Atlantic Right Whale Biology Cruise.

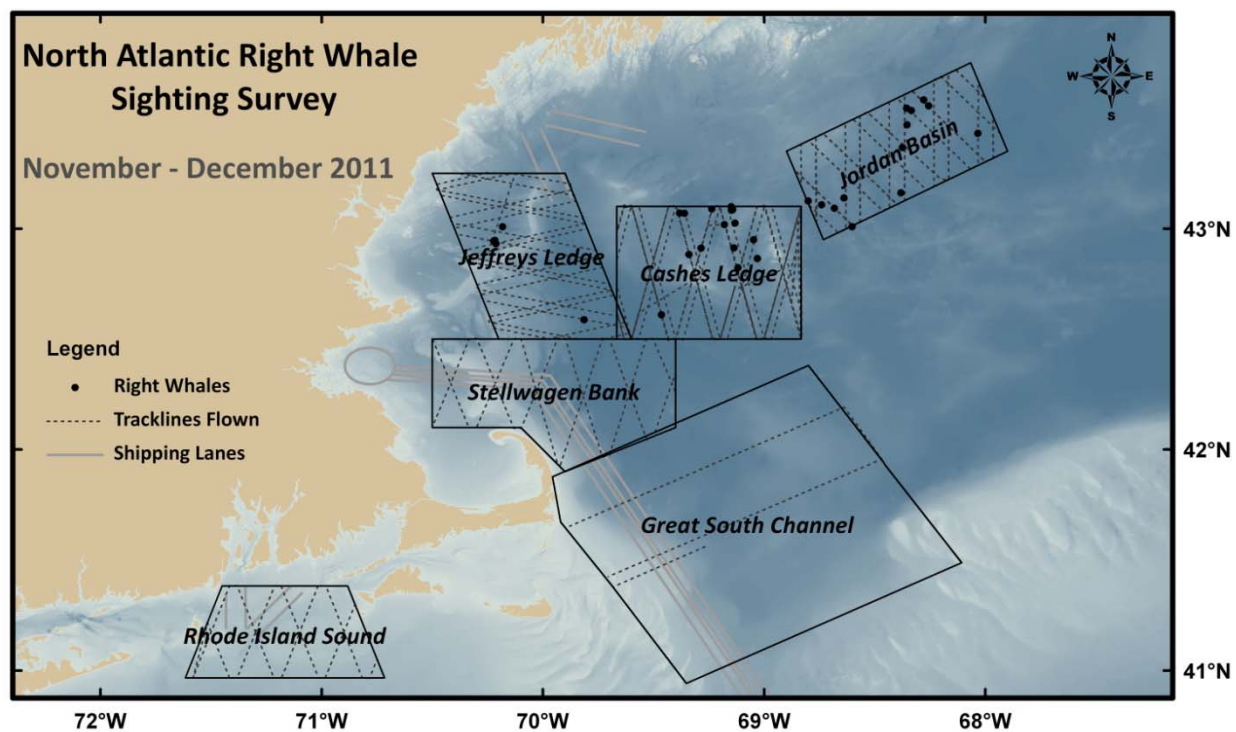


Figure 1c. North Atlantic Right Whale Sighting Survey (NARWSS) track lines and right whale sightings from November through December, 2011.

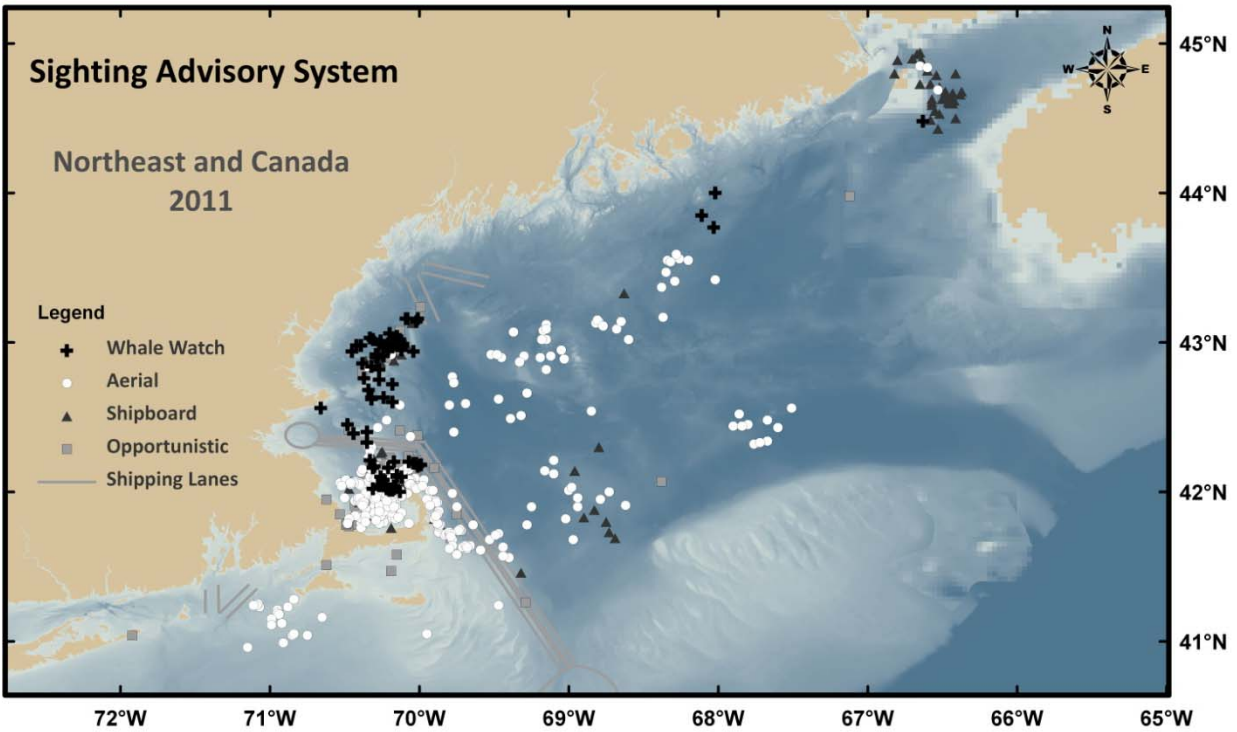


Figure 2a. Locations of all right whales reported to the Right Whale Sighting Advisory System (RWSAS) within Northeast US and Canadian waters in 2011, shown by reporting source. The category “Opportunistic” includes reports made by the general public, the Coast Guard, commercial ships, and fishing vessels. Unconfirmed reports were excluded from this figure.

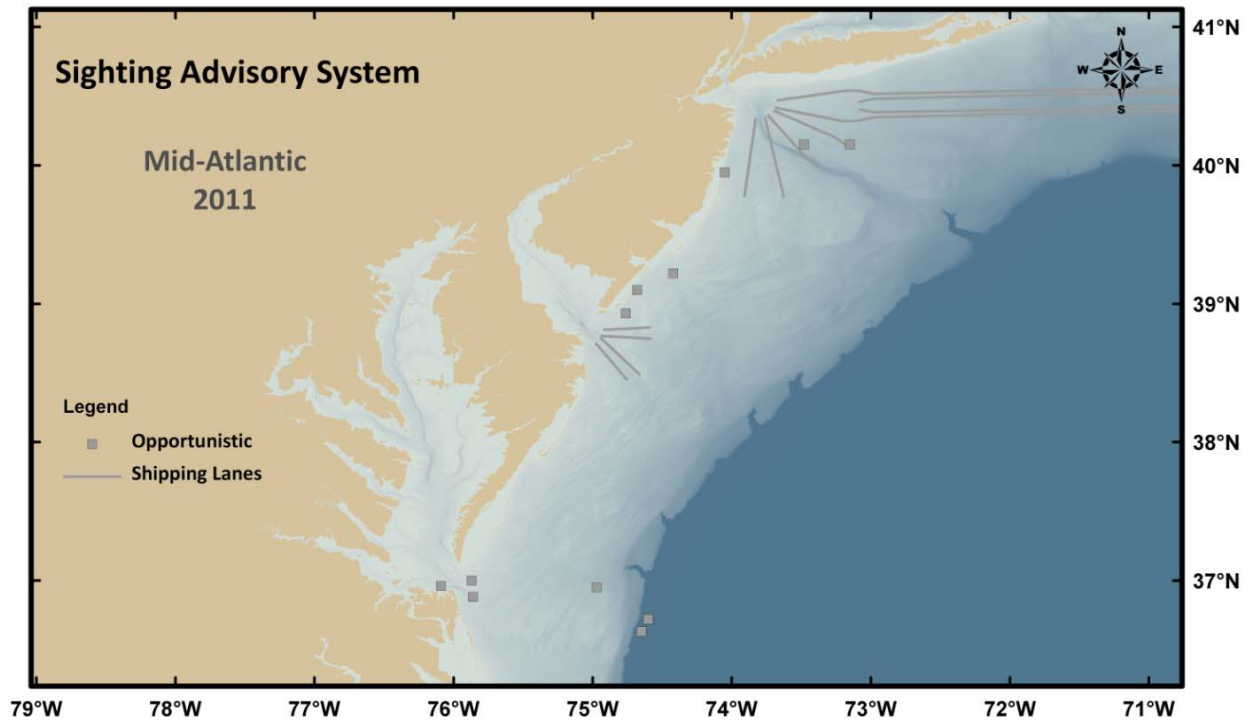


Figure 2b. Locations of all right whale sightings reported to the Right Whale Sighting Advisory System (RWSAS) within the Mid-Atlantic region in 2011, shown by reporting source. The category “Opportunistic” includes reports made by the general public, the Coast Guard, commercial ships, and fishing vessels. Unconfirmed reports were excluded from this figure.

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